

NOTES ON AUSTRALIAN DIPTERA WITH DESCRIPTIONS OF
THIRTEEN NEW SPECIES.

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(Communicated by E. W. Ferguson.)

Family MUSCARIDAE.

Subfamily PHAONINAE.

Genus DICHÆATOMYIA Malloch.

The Australian species of this genus which I have seen are largely or entirely yellow in colour. Some of the species extend their range into New Guinea, but so far as I know none occur in the southern parts of Australia, in Tasmania or New Zealand. Under certain of the species I discuss their relationships and identities, but only an examination of the type specimens of some of Stein's species described under *Mydaea* will definitely decide the question of specific names.

There are two or three rather clearly defined groups amongst the Australian species. Three of the species may be separated from all the others by the character of the hairing of the scutellum. In these species the minute black hairs descend to the lower margin of the sides of the scutellum and well below the level of the strong marginal bristles, while in the other species these hairs are discontinued at or very close to the bases of the bristles. The three species in this first section, i.e., with lateral scutellar hairs, may be separated as follows:

Key to species.

1. Males 2
Females 4
2. Thorax with 2 + 3 dorsocentral bristles; mid femur with a series of four or more black bristles on basal third of anterodorsal surface, which are quite conspicuous; hind femur with rather dense black setulose hairs on median third of ventral surface which become longer apically, the anteroventral bristles very long from near base to near apex, their tips hair-like; fore tibia with usually an anterodorsal and an anteroventral bristle near middle *rigidiseta* Stein
Thorax with 2 + 4 dorsocentral bristles; mid femur without distinct anterodorsal bristles at base; hind femur not armed as above 3
3. Fore tibia with at least one median bristle; hind femur swollen near base, the swollen part with dense erect short black hairs which are flexed near the apices, a stout black thorn about one-third from apex on posteroventral surface which is much longer than the diameter of femur, directed obliquely forward, and has its tip bent *armata* Stein
Fore tibia unarmed at middle; hind femur normal, with a series of bristles

- on basal half of posteroventral surface and another on apical half of anteroventral surface *setulifera* Stein
4. Thorax with 2 + 3 dorsocentral bristles *rigidiseta* Stein
- Thorax with 2 + 4 dorsocentral bristles 5
5. Fore tibia with one anterodorsal and one posterior bristle near middle *armata* Stein
- Fore tibia without median bristles *setulifera* Stein

DICHAETOMYIA RIGIDISETA (Stein).

Termes. Fuzetek, vol. 23, 1900, p. 139 (*Mydaca*).

This species agrees very well in colour with *armata* Stein which I described in a previous paper on Australian Diptera. Structurally it agrees also, but the characters listed in the above key will readily distinguish it. Both of these species are much more slender than is *setulifera*, the abdomen being more elongate especially, and the bristles on apical tergites are much stronger. The eyes are more widely separated above also. All three species have the hypopleura with some microscopic black hairs in two groups, one below spiracle and the other near lower posterior angle.

Length, 7-8 mm.

Originally described from New Guinea in the female sex only. I have before me one female from Hamilton, and a male from Eidsvold, Queensland. I have no doubt these specimens are referable to Stein's species, the female agreeing in every particular with his description. I suspected this was the same as *armata* until I received the male.

DICHAETOMYIA ARMATA Stein.

I have previously given a description of the male of this species. The female may be distinguished by the characters listed in the above key.

Before me there are a number of both sexes from New South Wales, Queensland, and New Guinea.

DICHAETOMYIA SETULIFERA Stein.

This species agrees in structure and chaetotaxy with the typical form of *quadrata* Wiedemann, an oriental species which is very widely distributed, but the entire thorax is rufous yellow except a small spot below wing base, and the grey pruinescence gives the dorsum a trivittate appearance when it is viewed from behind. Palpi and antennae yellow. Abdomen frequently entirely yellow, but more usually more or less darkened apically. The armature of the hind femur is the same in *quadrata* as in the species under review.

Length, 6.5-8 mm.

Localities, male, Hamilton, Queensland, January, 1890; 6 males and 3 females, Cairns, Queensland; 3 females, Gordonvale, Queensland; 1 male, Hamilton, Queensland.

It is possible that this species, which was originally described from an Australian specimen in a paper on African species, is merely a variety of *quadrata* but it is so constant in colour and so uniformly different in this respect from the typical form of that species that I have no hesitation in retaining its distinct specific status.

It appears pertinent to note that there is a variety of *quadrata*, *lineata* Stein, in which the postsutural dorsocentral bristles are invariably three in number. It is my opinion that this form is a distinct race or species. It does not occur, nor does *quadrata*, in Australia, though the latter is found in New Guinea.

The second group contains a few species that conform more closely to the general run of those found in the Orient and in Africa. There are some of them, however, which have the eye facets in the males very strikingly enlarged on the upper half, the largest of the facets being equal in size to the anterior ocellus. In these species the frons is reduced to a mere line, consisting of the contiguous orbits, the interfrontal stripe being entirely obliterated on all but the anterior margin. This group is, however, not clearly delimited as there is one species in which the facets are not very noticeably enlarged and which has the interfrontalia also obliterated, while another has the eyes practically normal and the interfrontalia distinct on the entire length of frons. As in the great majority of the Oriental species of the genus there are few striking specific characters one must resort to minute details for distinguishing the species. These however appear to be quite constant and with a little practice one can readily distinguish the species. I present a key for the identification of those species already known to me.

Dr. E. Bergroth some years ago described a species, *Spilogaster fuscitarsis*,* which may be referable to this genus. Unfortunately he informs me that the type specimen has been destroyed, and as without it it is impossible to definitely establish the identity of the species, I fear it will have to be considered as without status. From the description it appears to be similar to *setulifera* and *armata*, both of which have the thorax more or less distinctly vittate, but neither of these species has the palpi and tarsi fuscous, which would appear to justify us in regarding them as distinct from *fuscitarsis*. There are also some yellow species in other genera, some of which agree more or less closely with the description of Dr. Bergroth's species. I append the description as given.

"*SPILOGASTER FUSCITARSIS* n.sp."

"Luteo-ferruginea, dorso thoracis vittis tribus albescentibus notato, callo humerali etiam levissime albido-pruinoso, segmentis duobus ultimis dorsalibus abdominis plaga magna communi nigra praeditis. Caput cinereo-argenteum, vitta frontali nigricante, proboscide et palpis fuscis, antennis luteo-ferrugineis, articulo ultimo apicem versus fusciscente, seta longe plumosa, fusco-nigra, basi flavida. Thorax macrochaetis postsuturalibus quatuor instructus. Alae leviter cinerascetes, venis anterioribus flavescentibus, posterioribus fusciscentibus, vena transversa postica undulata; squamae luteo-ferrugineae. Pedes luteo-ferruginei nigro-setulosi et pilosi, tarsi fuscis, tibiis posticis medio seta una rigida exserta instructis. Long. female, 9 mm." Central Queensland.

Key to species.

- | | |
|---|----------------------------|
| 1. Males | 2 |
| Females | 8 |
| 2. Hind femur with four or five long black bristles on apical third of antero-ventral and posteroventral surfaces which are much longer than diameter of femur | <i>terraereginae</i> sp.n. |
| Hind femur without long bristles on apical third of posteroventral surface | 3 |
| 3. Basal half of posteroventral surface of hind femur with a series of long fine bristles, some of which are longer than the diameter of femur; facets of upper half of eye very conspicuously enlarged | <i>megophthalma</i> sp.n. |
| Basal half of posteroventral surface of hind femur without distinct bristles, or if any are present they are not nearly as long as diameter of femur | 4 |

*Stett. entomol. Zeit., 1894, p. 74.

4. Thorax with four pairs of equally strong postsutural dorsocentrals . . . 5
 Thorax with three equally strong pairs of postsutural dorsocentrals and
 with or without a much weaker anterior pair of postsutural setulae . 7
5. Hind femur with at most three or four anteroventral bristles on about the
 apical third; the uppermost hairs of the pteropleural group brown or
 fuscous *rufa* Stein
 Hind femur with six or seven anteroventral bristles, the basal one close to
 the middle of femur; all the pteropleural hairs yellow 6
6. Facets of the upper half of eyes rather abruptly enlarged centrally; frontal
 orbits contiguous, obliterating interfrontal stripe . . . *flavohirta* sp.n.
 Facets of eyes gradually enlarged in the normal manner; frontal orbits
 narrowly separated by a black interfrontal stripe . . . *luteohirta* sp.n.
7. Thorax with three pairs of long postsutural dorsocentrals . . . *apicalis* Stein
 Thorax with three pairs of long and one pair of very short postsutural
 dorsocentrals *impar* Stein
8. Thorax with four strong pairs of postsutural dorsocentral bristles . . . 9
 Thorax with three strong or three strong and one very weak short pair of
 postsutural dorsocentral bristles 10
9. Pteropleural hairs all yellow, those on prosternum concolorous
 *flavohirta* sp.n.
 *luteohirta* sp.n.
 Pteropleural and prosternal hairs largely or entirely fuscous
 *megophthalma* sp.n.
 *terraereginae* sp.n.
 *rufa* Stein
10. Postsutural dorsocentrals consisting of three long pairs which are equally
 distant and the third (anterior) pair of which is much in front of the
 anterior intra-alar pair *apicalis* Stein
 Postsutural dorsocentral bristles consisting of three long and one very short
 pair, the third pair from hind margin but little in front of the anterior
 pair of intra-alar bristles *impar* Stein

DICHAETOMYIA TERRAEREGINAE sp.n.

Male.—Rufous yellow, shining. Head fuscous, antennae yellow, third segment largely brown; palpi brownish to fuscous yellow. Thorax with faint white pruinescence anteriorly, the slender vittae visible only from behind. Abdomen with the apical two tergites more or less infuscated. Legs yellow, tarsi hardly darkened. Wings, calyptrae, and halteres yellow.

Eyes subcontiguous, bare, facets normal; interfrontal stripe obliterated in middle; palpi slender. Anterior presutural and postsutural dorsocentral bristles not much shorter than the other pairs; prealar short; hypopleura with a few very fine hairs. Hind femur with about four or five long bristles on apical third of anteroventral surface and some similar bristles on same part of posteroventral surface, only two of which may be present in some specimens.

Length, 5-6 mm.

Type, and allotype, Dawson River, Queensland, 1923 (Baneroff). Paratypes, South Queensland (T. L. Baneroff); Lisarow, N.S.W., January 5, 1915, on human faeces; Coramba-Dorrigo Rd., 1,000 feet, January 31, 1923; Lowanna, E. Dorrigo, January 31, 1923.

DICHAETOMYIA MEGOPHTHALMA sp.n.

Male.—Head fuscous, face paler, antennae yellow, third segment brownish apically, palpi fuscous. Thorax yellow, the grey pruinescence when viewed from

behind forming a broad vitta anteriorly which is separated from the outer one on each side by a narrow line mesad of the dorsocentrals. Abdomen yellow. Apices of tarsi very slightly darkened. Wings, calyptreae, and halteres yellow. Fine thoracic hairs yellow.

Frons reduced to a mere line; facets of eyes suddenly enlarged at middle, those of upper half in large part individually as large as anterior ocellus and distinctly wider than frons at middle. Dorsocentrals 2 + 4, all long; anterior intra-alar short. Hind femur with two or three preapical anteroventral bristles, and a series of fine bristles on basal half or more of posteroventral surface some of which are at least as long as diameter of femur; tibiae normal. Fourth vein curved.

Length, 5.5 mm.

Type, Cairns, North Queensland (J. F. Illingworth).

Type in United States National Museum.

DICHAETOMYIA FLAVOHIRTA sp.n.

Male and female.—Differs from *terraereginae* in having the antennae paler, and the palpi darker.

The enlarged eye facets are smaller than in preceding species and the transverse division less abrupt; the pteropleural and propleural hairs are yellow and not dark, the mid femur has a few longish posteroventral setulae, and the hind femur has about seven bristles on apical half of anteroventral surface and usually a few short fine bristles at or near middle on posteroventral surface. The thoracic chaetotaxy is the same as in preceding species.

Length, 7-8 mm.

Type, male, allotype, seven male and six female paratypes, Cairns, North Queensland (J. F. Illingworth); one male paratype, Townsville, North Queensland (G. F. Hill).

Type in United States National Museum.

DICHAETOMYIA LUTEOHIRTA sp.n.

Male.—Similar to *flavohirta*; differs as noted in the key. The largest of the eye facets are not over one-third as wide as narrowest part of frons and there is no abnormal enlargement anywhere, merely the ordinary gradual increase in size normal to the males of this group.

Length, 7-8 mm.

Type, male, one male paratype, and allotype, Townsville, Queensland (H. Priestly).

DICHAETOMYIA RUFA Stein.

Term. Fuz., vol. 23, pl. 132, 1900 (Spilogaster).

Similar in colour to the preceding species, the antennae usually yellow, palpi fuscous, and apex of abdomen darkened.

The eye facets are rather more enlarged above than in last, but the frons is narrower and the interfrontal stripe obliterated at middle.

Length, 6-7 mm.

A large series from Cairns and Gordonville, Queensland, one from Sydney, and one from the Fiji Islands. Originally described from New Guinea.

DICHAETOMYIA APICALIS Stein.

Tijdschr. v. Ent., vol. 47, p. 103, 1904 (Spilogaster).

One male from Cairns, Queensland, agrees with the description of this

species. It is very similar in all respects to *rufa*, differing in having but three pairs of postsutural dorsocentral bristles.

Length, 5.5 mm.

Originally described from Java.

DICHAETOMYIA IMPAR Stein.

Two males and one female agree with the description of this species.

Length, 6-7 mm.

Localities, Lowanna, E. Dorrigo, N.S.W., January 30, 1923; Hamilton, Queensland, and Maianda, Queensland.

Originally described from Java.

GENUS LIMNOPHORA Robineau-Desvoidy.

The group dealt with in this paper consists of those species in which there are some setulose hairs along the sides of the prosternal plate and some microscopic setulae at base of the third vein of the wing. There is considerable variation in the structure of the head in this group, some males having the frons one-third or more of the head width while others have it very narrow. However there is no good reason for the separation of these groups, nor is there any reason why the species with the arista distinctly haired should be separated subgenerically from those which have the arista pubescent or almost bare. The genus as here limited is very widely distributed, occurring in all faunal regions, and the species are, so far as I am aware, always found near bodies of water, some of them at least occurring in the larval stages in running water. I present a key for the identification of the species known to me from Australia, but it is extremely improbable that this is more than a small percentage of the total that occur on this continent.

Key to species.

1. First wing vein with distinct setulae on upper surface; eyes in male separated by about one-third of the head width; thorax with a pair of large subtriangular or subquadrate black spots in front of suture separated by a grey pruinose area, and another pair of larger spots behind suture *orthoneura* Malloch
First wing-vein bare both above and below 2
2. Males 3
Females 4
3. Frons about as wide as third antennal segment; dorsum of thorax with a large shining transverse black spot in front of suture which covers almost all of disc, and another behind suture; arista short haired *pulvillata* sp.n.
Frons about one-third of the head width; dorsum of thorax with three or five dark dorsal vittae; arista almost bare *divergens* sp.n.
4. Entire frons including orbits opaque deep black, the face and parafacials silvery, the latter sharply differentiated from the frontal orbits at bases of antennae; disc of thorax chocolate brown, the vittae a little darker; abdominal spots fused in centre, leaving only a narrow transverse grey mark on each anterior lateral angle . . *nigriorbitalis* Malloch
Frons not entirely deep black, the orbits and frontal triangle greyish or brownish pruinose; disc of thorax without black or brown colour between the dark vittae or spots; abdominal dark spots not fused on entire length of median line 5

5. Arista almost bare; thoracic dorsum with five distinct blackish brown vittae; first posterior cell of wing not narrowed apically . . . *opacifrons* Malloch
 Arista short haired; thoracic dorsum with two faint dark spots and a median faintly indicated vitta in front of suture and a faint dark transverse blackish mark behind it; first posterior cell of wing distinctly, though not conspicuously, narrowed apically *pulvillata* sp.n.

LIMNOPHORA DIVERGENS sp.n.

Male.—Head black, face, parafacials, and cheeks densely white pruinose, the two former slightly brassy; interfrontalia black, orbits yellowish grey, triangle brownish pruinose; occiput grey pruinose, darker in centre. The five dark thoracic vittae more or less fused at centre in certain lights; pleura and postnotum pale grey, unspotted; scutellum black, a little paler in centre in certain lights. Abdominal tergites 1, 2, and 3 each with a pair of large transverse black spots on hind margins, those on 2 and 3 most conspicuous and separated by a broad wedge-shaped pale grey mark, fourth tergite with a narrow fuscous central line. Legs black, femora not densely pruinose. Wings hyaline, cross-veins faintly clouded. Calyptrae whitish. Halteres yellow.

Frons one-third of the head width; upper two orbitals sloped over eye and backwards; arista rather thick, with short pubescence; vibrissal angle produced; cheek about as high as width of third antennal segment. Thoracic dorsocentrals 2 + 3, both intra-alars strong. Abdomen narrowly ovate; fifth sternite with a broad shallow rounded emargination. Fore tibia without a median bristle; mid tibia with one posterodorsal and one ventral bristle; hind femur with about three anteroventral bristles on apical half; hind tibia with one anterodorsal and one anteroventral bristle. First posterior cell of wing not noticeably narrowed at apex.

Length, 4.5 mm.

Type, Sydney, N.S.W., November 4, 1923.

LIMNOPHORA PULVILLATA sp.n.

Male.—Head black, orbits and face whitish pruinose. Thorax shining black, with lateral margins broadly, a narrow fascia on anterior margin of suture which is interrupted in middle, and the posterior half of postsutural region whitish pruinose; scutellum greyish on sides apically. First visible abdominal tergite black, with a narrow grey hind marginal fascia and a very faint greyish central line; second and third tergites each with a pair of large shining subtriangular black spots which extend the whole length of segments and are narrowly separated in centre; fourth tergite brown, the anterior lateral angles whitish. Legs black. Calyptrae white, slightly brownish apically. Halteres yellow.

Eyes bare; frons at narrowest point about as wide as third antennal segment; longest hairs on arista a little shorter than width of third antennal segment; vibrissal angle not noticeably produced, the single vibrissa very strong, other bristles weak. Thorax with 2 + 3 dorsocentrals, and about four series of weak presutural acrostichal hairs. Abdomen elongate oval, fifth sternite with a large rounded emargination. Fore tibia without a posterior median bristle; mid tibia with one posterior bristle; hind femur with a complete series of rather short, very fine posteroventral bristles and one or two preapical anteroventral bristles; hind tibia with one anterodorsal and one anteroventral bristle; pulvilli long.

Female.—Differs from the male in having the thoracic markings less distinct and with traces of the normal three dark vittae showing through them.

Frons fully one-third of the head width. Legs as in male but the fine posteroventral bristles lacking on hind femur, and but one preapical anteroventral bristle.

Length, 4-4.5 mm.

Type, male, Eidsvold, Queensland, April 16, 1924 (Bancroft). Allotype, Ecclestone, Allyn River, February 26, 1921. One female paratype, Mosman, February 4, 1923.

Genus *NEOHELINA* Malloch.

Generic characters.—Eyes separated by nearly one-third of the head width in both sexes; orbits distinct, each with about seven bristles, the upper one or two on each side in female curved outward over eyes, the others incurved, in male all bristles are incurved; a long pair of bristles between the anterior and posterior ocelli and a shorter pair between the posterior ocelli and the postvertical bristles; antennae short, third segment not much longer than second; arista with moderately long hairs; cheek not over one-fourth of the eye height. Thorax with two presutural dorsocentrals; sternopleurals 1:2; scutellum bare below; postscutellum lacking. Abdomen subcylindrical. Sixth wing-vein falling short of margin of wing; costa ending just beyond apex of third vein. Hind tibia with two posterodorsal bristles; hind tarsus without a ventral basal bristle. Lower calyptra longest.

Genotype, *Neohelina semivittata* Malloch.

There are two species of the genus known to me, one of them being undescribed. I append a diagnosis for their separation.

- A. Legs yellow, tarsi fuscous; abdomen yellow, greyish pruinose, each tergite with an elongate fuscous mark in centre which does not reach hind margin *semivittata* Malloch
- AA. Legs fuscous, tibiae tawny yellow; abdomen glossy brownish black, apices conspicuously tawny yellow *flavomarginata* sp.n.

NEOHELINA SEMIVITTATA Malloch.

I have seen only the type and paratype specimens of this species, from New South Wales. The description appeared in my series of papers on Exotic Muscaridae, part xiii., *Annals and Magazine of Natural History*, 1924, p. 414.

The species is larger than the new one, measuring 8 mm. in length.

NEOHELINA FLAVOMARGINATA sp.n.

Female.—Brownish black, thorax subopaque, abdomen almost glossy. Second antennal segment and base of third, palpi, apices of abdominal tergites, and the entire tibiae tawny yellow; interfrontalia brownish rufous; thorax with four narrow black vittae, the median pair not continued to hind margin, the laterals interrupted at suture. Wings smoky, apex of first vein and both cross-veins slightly clouded. Calyptrae whitish. Halteres fuscous.

Palpi slender. Thorax with the short hairs quite strong; one or two pairs of irregular presutural acrostichals evident; prealar bristle absent; postsutural dorsocentrals 3 pairs; scutellum flattened above, with four long and one short pairs of marginal, and one subapical pair of discal bristles. Fore tibia shorter than fore tarsus, with two or three short anterodorsal setulae; mid tibia with two anterodorsal and two posterodorsal bristles; hind femur with a few irregular anteroventral and posteroventral bristles apically; hind tibia with two posterodorsal, two anterodorsal and two anteroventral bristles. Costal thorn long, equal to inner cross-vein, the setulae rather pronounced to just beyond apex of

second vein; inner cross-vein beyond apex of first vein and close to one-fourth from apex of discal cell; outer cross-vein at about its own length from inner and fully that length from apex of fifth vein.

Length, 4 mm.

Type and one paratype, Myponga, S.A. (A. H. Elston).

It must be noted that Stein described a species under the name *Limnophora dasyops* in 1910, in volume 8 of the Annals of the Hungarian Museum, page 556. This species is an aberrant one belonging to a group which is very well represented in New Zealand but apparently absent from any other faunal region. I have been trying to work out the relationships of the species of this group for some time and up to the present have not decided what genus they ought to be placed in. Temporarily I have relegated some of them to *Melanochelia*, but some undoubtedly belong near to if not in *Lispoides* which is represented by one North American species. I have *dasyops* from New South Wales.

Genus MYOSPILA Robineau-Desvoidy.

In Europe and North America this genus is represented by the genotype, *meditabunda* Fallen, a black species with paired spots on dorsum of abdomen. The only Australian species already referred to the genus, *flavicans* Malloch, is yellow in colour, and another similar in colour is now before me.

The genus differs from *Dichaetomyia* in having the pteropleura and prosternum bare. The third vein has some setulae at base both above and below, and the fourth vein is curved forward apically; the hind tibia has no strong posterodorsal bristle beyond middle; the prealar bristle is present but small; and the arista plumose.

The new species described herein differs from *flavicans* in much the same manner as does *setulifera* from *armata* and *rigidiseta* in *Dichaetomyia*, the abdomen being much more robust and with less evident bristles.

I present a diagnosis for the recognition of the two species.

- A. Palpi yellow; hypopleura with some very fine yellow hairs on upper margin in front of spiracle; one black setula on hind margin of metathoracic spiracle; fourth wing-vein conspicuously curved forward apically *hypopleuralis* sp.n.
- AA. Palpi fuscous or black; hypopleura bare; no setula on hind margin of metathoracic spiracle; fourth wing-vein but little curved forward apically *flavicans* Malloch

MYIOSPILA HYPOPLEURALIS sp.n.

Male and female.—Testaceous yellow, slightly shining. Occiput and frons blackish, frontal orbits and face white pruinose, occiput grey pruinose. Thorax not distinctly vittate, with a patch of white pruinescence on anterior margin between the dorsocentrals which is best seen when viewed from behind. Abdomen more or less fuscous brown, sometimes entirely so, the dorsum with greyish pruinescence. Legs yellow. Wings, calyptres and halteres yellowish.

Frons in male linear, in female about one-fourth of the head width at vertex, not noticeably widened anteriorly, and without cruciate bristles; palpi slender in both sexes. Abdomen more robust than in *flavicans*, the genital segments in female not exposed so that it is impossible to see if there are bristles present. First posterior cell at apex not much more than half as wide as at its widest part.

Length, 8 mm.

Type, Staunary Hills, North Queensland, about 3,000 feet (T. L. Bancroft). Allotype and a paratype of each sex, Cairns, North Queensland (J. F. Illingworth).

This species may possibly be considered as entitled to generic separation from the true *Myiospila* species on the basis of the characters used in the diagnosis herein presented, but there are so many questions of relationships still unsettled in this group that I believe it would be unwise to erect even a sub-genus for it.

I have a number of specimens that appear to belong to *flavicans* Malloch, but in the series I find differences of structure that lead me to suppose that there are probably two or more species represented in the material. I hope later to obtain more specimens to enable me to arrive at a decision on this matter.

Subfamily COENOSIINAE.

The amount of material in this subfamily which I have does not warrant my treating it comprehensively, my present effort being merely to distinguish two of the genera that occur in Australia and to define two species of each. There are no doubt some more species of each genus present but they are not available to me now.

Genus COENOSIA Meigen.

This genus differs from my interpretation of *Caricea* in having the hind tibia with an anteroventral and an anterodorsal bristle near middle, the latter being in all cases higher placed than the former, while in the other genus there is an anterior and an anterodorsal bristle present, both of which are rather closely placed and usually at the same height. I furnish sketches of the two tibiae for reference, see Figure 1.



Fig. 1.

Of *Coenosia* I have two species from Australia, one of which is undescribed. Both have the third antennal segment with a very evident thorn-like tip on upper side, a character not at all common in the genus, and both have also the dorsum of thorax with a broad brown or fuscous mark covering the area between the lines of dorsocentrals, at least posteriorly, which colour is continued over disc of scutellum. This stripe consists of the three fused dorsal vittae normal to most species.

I present a diagnosis for the separation of the species.

- A. Tibiae entirely tawny yellow in both sexes; fore tarsi of male slender, when seen from above distinctly narrower than apex of tibia *acuticornis* Stein
- AA. Tibiae yellowish only at bases in male, fore tarsi in same sex distinctly flattened, when seen from above at least as wide as apex of tibia *latitarsis* sp.n.

COENOSIA ACUTICORNIS Stein.

Apparently a very common species in Australia, many specimens being before me from various parts of New South Wales, Queensland, and Tasmania. It was originally described from Victoria.

COENOSIA LATITARSIS sp.n.

Male.—This species has the paired dorsal abdominal spots fused as in the preceding species. The only distinctions between the species are those listed in the synopsis, though it is very probable that the hypopygia will furnish some that are not evident in the type specimen, which has the genital organs unexposed.

Length, 3.5 mm.

Type, Bulli, N.S.W., August 25, 1923.

Genus *CARICEA* Robineau-Desvoidy.

I have before me what appear to be two species of this genus. One of these is represented by two males and the other by a number of females. If this material all belongs to one species they represent a sexual colour dimorphism which is not equalled by any other of the numerous species of the genus known to me from other parts of the world. The genus is represented by one species in North America and by the same and possibly one or two other species in Europe; the number of species occurring in Africa is very large. It is a peculiar fact that in North America and Europe the genus *Coenosia* is represented by a very large number of species while *Caricea* is very poorly represented, and the reverse is the case in Africa where *Caricea* abounds and *Coenosia* is almost unrepresented. It will be of interest to discover which genus is most common in Australia.

The adults of both genera occur on flowers and tree-trunks, though many, if not all, of the species are predaceous on small insects.

Diagnosis of species.

- A. Legs, antennae, and palpi almost entirely yellow; abdomen with a dorsocentral dark vitta *subvittata* sp.n.
 AA. Legs, antennae, and palpi fuscous, only the tibiae tawny yellow; abdomen with an interrupted dorsocentral vitta and a pair of large subtriangular spots on each tergite from first to third black *imitatrix* sp.n.

CARICEA SUBVITTATA sp.n.

Male.—Black, densely pale grey pruinosecent. Frons and face in some lights silvery grey; antennae yellow, base of second segment grey; arista black; palpi brown, paler at apices. Thorax slightly darker along the lines of dorsocentrals, but not vittate. Abdomen more brownish on dorsum and with a faint dark dorsocentral line. Legs yellow, tarsi slightly brownish. Wings hyaline. Calyptrae white. Halteres yellow.

Frons one-third of the head width, parallel-sided, orbits poorly differentiated, each with three widely separated bristles and no fine hairs; parafacials distinct on entire length, not as wide as third antennal segment, the latter short, not extending two-thirds of the way to mouth margin; arista with very short pubescence; proboscis slender; palpi normal. Thoracic bristling normal. Abdomen subovate, hypopygium small. Bristles on fore femora long and fine, those

on posteroventral surface not extending to apex; median posterior bristle on fore tibia long; mid tibia with one anterodorsal and one posterodorsal bristle; anterodorsal bristle on hind tibia much longer than anterior one and at almost same height; hind metatarsus about one-third of the length of hind tibia; hind femur with a few very short setulae on basal half, without a preapical bristle on anteroventral surface, and with some bristles on basal half of posteroventral surface the apical one long. Inner cross-vein at middle of discal cell; outer at nearly its own length from apex of fifth vein.

Length, 3 mm.

Type, Mosman, N.S.W., 1.10.1923 (Mackerras).

CHARICEA IMITATRIX sp.n.

Female.—Head black, face, frontal orbits, and triangle pale grey pruinose, interfrontalia slightly greyish; antennae and palpi black. Thorax and abdomen black, slightly shining, with brownish grey pruinescence, the former with three darker vittae, the latter with a narrow dorsocentral vitta and a large sub-triangular spot on each side of each tergite, which markings are commonly fused centrally and most readily seen when viewed from behind. Legs black, tibiae varying from brownish to tawny yellow. Wings hyaline. Calyptrae white. Halteres pale yellow.

Antennae not extending to lower third of face, third segment not twice as long as second; arista distinctly pubescent. Sentellum with four equal bristles. Abdominal bristles short. Armature of legs as in last species but the hind femur has about six widely spaced bristles on anteroventral surface and about four longer more widely spaced bristles on posteroventral surface.

Length, 3-4 mm.

Type, and four paratypes, Mosman, two paratypes, Sydney, N.S.W.

The genus *Pygophora* was originally described from Australia by Schiner and of the genus I have seen the genotype and two other species, one of which I am not certain of so far as specific identity is concerned. In my next paper I hope to give a synopsis of the Australian species. The genus *Atherigona* has been placed in this subfamily also but I am now convinced that this is an error and later on I will deal with the Australian species of the genus, some three or four of which are at present known to me. Some species of this last genus destroy forage plants and cereals by boring in the stems.

Subfamily LISPINAE.

Genus *LISPA* Meigen.

In a previous paper I presented a key for the identification of the species of *Lispa* known to me from Australia. Since then I have received a number of species which are not included in the key and have made a new one which I hope will prove of service to students of the group.

Key to Australian species.

- | | |
|---|--------------------|
| 1. Males | 2 |
| Females | 8 |
| 2. Hind metatarsus fully twice as wide as second segment and but little longer than it, densely black haired below; frons, face, antennae, and palpi densely white pruinose, the palpi yellowish white; legs black | |
| | <i>cana</i> Walker |
| Hind metatarsus not noticeably wider than second segment and about twice | |

- as long as it; head parts not coloured as above; legs partly tawny yellow 3
3. Fore femora with two or more series of very short and rather stout spines on the ventral surfaces besides the usual long posteroventral bristles; palpi black; fore tibia without a posterior median bristle. *armipes* Becker
Fore femora with only the long posteroventral bristles below, no short spines 4
4. Mid femur with a rather dense series of short setulose black hairs on the posteroventral surface, most conspicuous and duplicated apically; hind tibia with a series of about eight long erect setulose hairs on apical half of posteroventral surface; abdomen glossy black, with one to four pairs of white spots on sides of dorsum *eidsvoldica* sp.n.
Mid femur without such a series of posteroventral short setulae; hind tibia not armed as above, and abdomen otherwise coloured 5
5. Palpi slightly and gradually dilated apically; thorax with three or five narrow blackish vittae, the central one generally extending distinctly over scutellum; mid and hind femora each with some widely separated long bristles on anteroventral surfaces; fore tibia without a median bristle; mid tibia with a median posterodorsal bristle; hind tibia without a posterodorsal bristle; first posterior cell of wing not appreciably narrowed apically *pumila* Wiedemann
Palpi with distinctly spatulate apices; thorax less distinctly vittate, the central vitta not continued over scutellum; first posterior cell of wing very noticeably narrowed apically; hind tibia with a posterodorsal bristle 6
6. Mid tibia with a strong ventral bristle near middle; hind femur with a bristle about one-third from base on posteroventral surface basad of which there are about three long fine ventral bristles; abdominal sternites 3 and 4 appearing black on discs because of a dense covering of very short stiff depressed black hairs; both pairs of presutural dorso-central bristles long and strong *xenochaeta* Malloch
Mid tibia without a ventral bristle near middle; hind femur not armed as above; sternites of abdomen not abnormally haired; presutural dorso-centrals short and weak 7
7. Mid and hind femora with long fine bristles on basal half of ventral surfaces, the latter without strong anteroventral bristles . . *weschei* Malloch
Mid and hind femora without long fine ventral bristles, the latter with two strong anteroventral bristles, one just beyond middle, the other near apex *incerta* sp.n.
8. Fore femur with two or three series of very short stout spines on ventral surfaces in addition to the long posteroventral bristles, one series on at least the apical half of anteroventral surface 9
Fore femur without such short spines, with inconspicuous decumbent hairs and long posteroventral bristles 10
9. Thorax and abdomen densely pale grey pruinulent, the former usually with traces of three narrow brownish vittae, the latter with two pairs of large spots on dorsum which are glossy and subtriangular; palpi fuscous, paler basally; halteres yellow; fore tibia without a median posterior bristle *armipes* Becker
Thorax and abdomen glossy black on dorsum, the former with traces of two vittae anteriorly and the sides greyish pruinulent, abdomen with a large spot on each side anteriorly and a small central spot on middle of hind

- margin of each tergite grey pruinose; palpi yellow; kalteres fuscous; fore tibia with a long posterior bristle beyond middle . . . *armata* sp.n.
10. Thorax with one presutural and two pairs of postsutural dorsocentrals, all very long, the anterior postsutural one as near suture as posterior pair is to hind margin; hind tibia with a posterodorsal median bristle; mid tibia with a strong median anterodorsal bristle *uniseta* Malloch
- Thorax with two pairs of rather short, or one pair of long and one pair of very short presutural dorsocentrals, and usually two very short and two long pairs behind suture, the anterior of the long pairs much farther from suture than the posterior pair is from hind margin 11
11. Legs entirely black, hind metatarsus thickened, but not so much so as in the male; antennae short, grey pruinose, not over half the length of face; palpi dilated; first posterior cell of wing not narrowed apically. *cana* Walker
- Tibiae largely or entirely tawny yellow; hind metatarsus not dilated; antennae nearly as long as face, not grey pruinose 12
12. Hind tibia without a median posterodorsal bristle; fore tibia with or without a median posterior bristle; first posterior cell of wing not appreciably narrowed at apex 13
- Hind tibia with a distinct median posterodorsal bristle; fore tibia with a median posterior bristle; first posterior cell of wing distinctly narrowed apically 14
13. Thorax densely grey pruinose, with three or five narrow darker opaque vittae, the median one evident on middle of scutellum; abdomen opaque grey pruinose, with a pair of very large shining quadrate black spots on each tergite which are narrowly separated by a median pale grey line; hind femur with an apical anteroventral bristle. *pumila* Wiedemann
- Thorax with three broad glossy black vittae, the separating pale lines much less conspicuously white than the lateral margins of mesonotum, the median vitta covering scutellum except on sides; abdomen glossy black, with a pair of round white spots on one or more of the tergites; hind femur with two anteroventral bristles, one near middle, the other near apex *eidsvoldica* sp.n.
14. Hind femur without strong anteroventral bristles beyond middle; fore tibia with an anterodorsal median bristle *weschei* Malloch
- Hind femur with two strong anteroventral bristles, one just beyond middle and the other near apex, if the former is absent the fore tibia has no median anterodorsal bristle 15
15. Mid tibia with a strong ventral bristle beyond middle . . . *xenochaeta* Malloch
- Mid tibia without a ventral bristle beyond middle *incerta* sp.n.
- N.B.—In my previous key I included *assimilis* Wiedemann. I am now of the opinion that this species does not occur in Australia. However, the group to which it belongs is in a very unsatisfactory condition and a careful examination ought to be made of the types of *assimilis* Wiedemann and *modesta* Stein as well as some other closely related species to decide how many species names are valid. The species I previously considered as *assimilis*, and possibly the one recorded as that by Stein, is now described under the name *incerta* sp.n.

LISPA ARMATA sp.n.

Female.—Frons black, slightly brownish pollinose, the orbits greyish only at anterior extremities; face, cheeks, and occiput white, almost silvery pruinose. upper third of latter darker; antennae fuscous, grey pruinose, apex of second

segment and base of third reddish; palpi tawny yellow. Thorax glossy black on dorsum, with traces of two submedian lines anteriorly and the lateral margins grey pruinulent; pleura whitish pruinulent. Abdomen glossy black on dorsum, with a small spot on centre of hind margin and a large transverse on each side anteriorly on each tergite from second to fourth white pruinulent. Legs black, knees narrowly rufous yellow. Wings smoky. Calyptrae white. Halteres fuscous.

Frons normal; parafacials rather wide, sparsely haired; arista plumose; antennae slender, reaching three-fourths of the distance to mouth margin; cheeks rather narrow; palpi gradually dilated. Thorax with 2 + 3 long strong dorso-centrals; prescutellar acrostichals absent; sternopleurals three. Abdomen narrowly ovate; apical bristles on third and fourth visible tergites long and strong. Fore femur as in *armipes* Becker; fore tibia with a strong posterior median bristle and three long apical bristles; fore tarsus about as long as fore tibia, basal segment rather stout; mid femur with some long fine posteroventral bristles on basal half and some shorter bristles on anteroventral surface, those on apical third forming a series of regular short setulae; mid tibia with a long posterior median bristle and five long apical bristles; hind femur with some irregular long fine bristles on basal half of posteroventral surface and some fine shorter bristles on some part of anteroventral surface, the latter surface with two strong bristles on apical half; hind tibia with one anterodorsal, one anteroventral and four long apical bristles. Third vein slightly undulated apically; first posterior cell not narrowed apically.

Length, 6 mm.

Type, Mosman, N.S.W., 2.4.1923.

LISPA EIDSVOLDICA sp.n.

Male and female.—Frons black, triangle greyish, orbits white pruinulent, as are also the face and cheeks, parafacials and face in male largely olive brown, the parafacials in female with a brownish mark at base of antennae; antennae black, apex of second segment yellowish; palpi yellow. Thoracic dorsum with three broad shining black vittae which are separated by greyish pruinulent stripes of about the same width that are not nearly so conspicuous as the white lateral margins of mesonotum, the median vitta extending over scutellum leaving only a narrow grey pruinulent margin on each side; pleura pale grey pruinulent, with a suffused fuscous vitta above. Abdomen glossy black, sometimes with four pairs of white lateral tergal spots, at times with only the pair on fourth tergite distinct. Legs black, apices of fore coxae, the trochanters, extreme tips of femora, and all of tibiae tawny yellow, coxae and femora grey pruinulent, mid tarsi yellowish at base. Wings hyaline. Calyptrae white. Halteres dark brown.

Frons over one-third of the head width; arista plumose; antennae about two-thirds of the length of face; parafacial narrow, with sparse fine hairs; cheek narrow; palpi abruptly dilated at apices. Thorax with one strong and one very weak pair of presutural dorsocentrals, the short pair sometimes practically absent, and two long and two very short pairs behind suture; presutural acrostichals absent; basal pair of scutellar bristles shorter than apical pair; propleural and stigmal bristles strong; sternopleurals 3. Abdomen in male cylindrical, fourth tergite covered with dense decumbent short black hairs, in female more ovate and with six genital spines. Posteroventral surface of fore femur with a complete series of bristles; fore tarsi subequal to tibiae, slightly flattened apically; mid femur in male with a comb of short black setulae on

anteroventral surface, most evident apically, and another on posteroventral surface which is dense and duplicated apically; mid tibia with a median posterior bristle; hind tibia with one anterodorsal and one anteroventral bristle in both sexes, in male with a series of long fine erect hairs on apical half of posteroventral surface; hind femur with two anteroventral bristles, one beyond middle and the other at apex. First posterior cell of wing almost imperceptibly narrowed apically.

Length, 5-5.5 mm.

Type, male, allotype and two female paratypes. Eidsvold, Queensland; one female paratype Marwood, Mackay, Queensland; one male paratype, much broken; Hugbenden, Queensland. Last specimen in United States National Museum.

In most particulars this species is similar to *leucospila* Wiedemann, both sexes of which are before me from Formosa. But the latter is a more brownish grey species, with usually no part glossy black, the pleural dark stripe is absent, and the abdomen has a greyish lateral continuous stripe instead of spots on each side in the male, and the abdomen is brownish grey with dark paired spots on dorsum in the female.

LISPA ASSIMILIS Wiedemann.

This species has been recorded from Australia by Stein. It belongs to a group which has the first posterior cell of the wing very distinctly narrowed at apex, containing, besides several extralimital species, three Australian forms, *weschei* Mall., *xenochaeta* Mall., and the one described below. I have seen specimens agreeing with the description of *modesta* Stein from Africa, from which continent *assimilis* was described under that name, and a series of specimens from Ceylon which agree with Wiedemann's description of *assimilis*. These differ from the two first mentioned species in having the fore femora with the series of bristles on the posteroventral surface distinct only on the apical half, a character which is present in the new species also. The fore tibia in *assimilis* has no anterodorsal bristle as in *weschei* and the mid tibia lacks the ventral bristle which is present in *xenochaeta*. In the other characters the females of *assimilis* and the new species are similar, but I have a male from Formosa before me which is distinctly different from the males of the Australian species now described, and as this appears to agree with the form recorded as that species from that island by Stein I have had no hesitation in using a new specific name for it. It would be advantageous to have an examination of the types of *assimilis* Wiedemann and *modesta* Stein made by some competent worker to learn whether they are, as Stein reports, synonyms, or distinct species.

In my recently published key I included *assimilis* amongst the Australian species; this name may be dropped for *incerta* included in the present paper.

LISPA INCERTA sp.n.

Male and female.—Head black, interfrontalia opaque, orbits, face, cheeks and occiput white pruinulent, triangle yellowish pruinulent, upper half of orbits blackish; antennae black, greyish pruinulent, apex of second segment yellowish; palpi yellow. Thorax grey pruinulent, darker on disc of mesonotum, slightly shining, and with three or five faint darker vittae. Abdomen grey pruinulent, each tergite with a pair of large subtriangular shining black spots, those on fourth visible tergite fused except at apex. Legs black, femora grey pruinulent, tibiae tawny yellow, fore pair darkened apically. Wings hyaline. Calyptres slightly yellowish. Halteres yellow.

Eye facets enlarged at middle on inner margin in both sexes; arista plumose; antennae about four-fifths of the face length in male, shorter in female; palpi spoon-shaped. Thorax with 2 + 4 dorsocentrals, the presutural and anterior two pairs of postsuturals very short. Abdomen elongate ovate. Fore tibia with one posterior median bristle; mid and hind femora attenuated apically, hind pair each with two strong bristles on anteroventral surface, one just beyond middle and the other near apex, and one at apex on posteroventral surface; mid tibia with one posterior and five or six apical bristles; hind tibia with one posterodorsal, one anterodorsal, and one anteroventral bristle. First posterior cell distinctly narrowed apically.

Length, 7-8 mm.

Type, male, allotype, Eidsvold, Queensland. Paratypes, Babinda and Darwin, Queensland.

The male from Formosa which I assign to *assimilis* has the mid femur with long hair-like bristles on entire length of ventral surfaces and a few much shorter hairs scattered on same surfaces of hind femur.